

Self-Harm and Suicide Among Virginia Youth Aged 9-18 Years, 2015-2021

VIRGINIA DEPARTMENT OF HEALTH

Summary Points

- **Self-harm emergency department (ED) visits and nonfatal self-harm hospitalizations are increasing. There is not a comparable increase in suicides among youth 9-18 years in Virginia.**
- **The majority of self-harm ED visits (68%) and nonfatal self-harm hospitalizations (74%) among Virginia youth were female. However, the majority of deaths (71%) by suicide were male.**
- **More than nine out of 10 nonfatal self-harm hospitalizations among youth were due to drug poisonings, compared to 7% of all youth suicides. Guns were the most common cause of youth suicide (51%).**
- **While the highest self-harm ED visit rate occurred in the Northwest region, the highest rate of self-harm hospitalizations and deaths by suicide occurred in the Central region.**
- **Young Virginians were hospitalized for self-harm-related injuries for 1,588 days with over \$13 million dollars in hospitalization costs in 2020.**

Introduction

Self-harm, or self-injury, is anything that a person does with the intent to hurt or cause an injury to themselves, including death. Suicidal ideation is where a person may have suicidal thoughts or ideas. Suicidal ideation and self-harm are risk factors that may lead to suicide. Suicide is defined as death caused by injuring oneself with the intent to die. Suicide was the second leading cause of death in youth aged 9-18 years in Virginia from 2016 to 2020.¹

In 2019, 22% of Virginia middle school and 16% of high school students who took part in the Youth Risk Behavior Surveillance survey reported seriously considering suicide; 9% and 7% of middle and high school students reported attempting suicide.² Trends in reported suicidal ideation and suicide attempts increased over time in Virginia. This mirrored national findings.^{3,4}

Several factors increase risk for suicide. These include a history of mental health disorders, alcohol and substance use, barriers to accessing mental health treatment, any type of loss, mental health stigma, relationship problems, physical illness, or social isolation.⁵ The Coronavirus Disease 2019 (COVID-19) pandemic highlighted many of these risk factors for youth mental health. Recent findings reported more suicide attempts among United States (US) youth.⁶ Approximately one in three US high school students who participated in a population-based survey also experienced poor mental health during the COVID-19 pandemic.⁷

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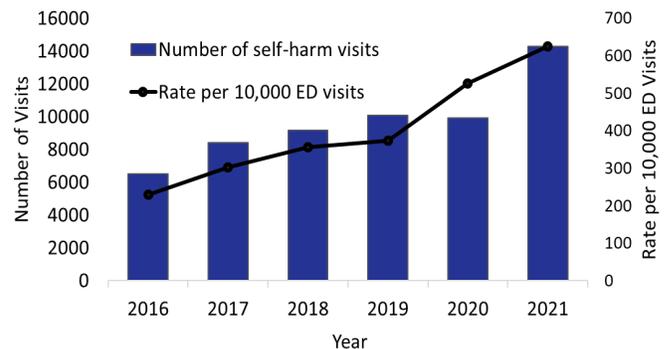
There are ways to prevent suicide or self-harm. It is important to reduce risk factors and increase protective factors. Protective factors, such as family and community connectedness, supportive healthcare relationships and access to services, reduced access to lethal means, and good resilience and coping skills can help to prevent self-harm and suicide.⁵

The Virginia Department of Health (VDH) examined self-harm and suicide among youth aged 9-18 years in Virginia. Data are from 2016-2021 for emergency department (ED) visits, 2016-2020 for nonfatal inpatient hospitalizations, and 2015-2021 for deaths by suicide. Virginia population estimates come from the Centers for Disease Control and Prevention (CDC) National Center for Health Statistics. VDH categorizes Virginia into five health regions: Central, Eastern, Northern, Northwest, and Southwest. See [list of cities, counties, and health districts in each region](#). More details about data sources, methods, and limitations are included on page 7.

Emergency Department (ED) Visits

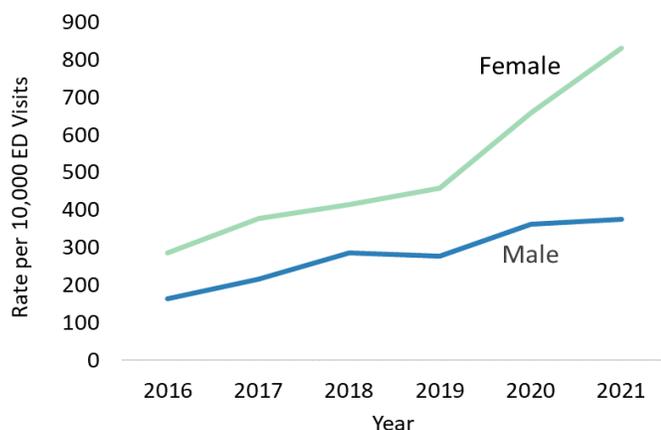
During 2016-2021, there were 58,442 self-harm ED visits among Virginia youth aged 9-18 years. This includes visits with suicidal thoughts, self-harm, or suicide attempts. Self-harm ED visits more than doubled among Virginia youth aged 9-18 years from 6,520 visits in 2016 to 14,298 visits in 2021 (Figure 1). The number of EDs reporting data increased from 92 in 2016 to 107 in 2021, which may have contributed to the observed increase in self-harm visits. In 2021, self-harm visits were 6% of all ED visits among 9-18 year old Virginians.

Figure 1. ED visits related to suicidal thoughts, self-harm, and suicide attempts among Virginia youth aged 9-18 years, 2016-2021



Note: From 2016 to 2021, the number of EDs reporting data increased from 92 to 107.

Figure 2. ED visit rates for suicidal thoughts, self-harm, or suicide attempts among Virginia youth aged 9-18 years, by sex, 2016-2021



During 2016-2021, 68% of self-harm ED visits in 9-18 year olds were among females. Between 2016 and 2021, self-harm ED visit rates increased among both males (129%) and females (190%; Figure 2).

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ED Visits (continued)

Compared to other groups, females aged 13-15 years experienced the highest self-harm ED rates annually (Figure 3). This was most notable in 2021 when the rate was 1,347 per 10,000 ED visits (or 13% of all ED visits).

The highest percent of self-harm ED visits among Virginia youth aged 9-18 years during 2016-2021 (56%) was non-Hispanic White. Nineteen percent were non-Hispanic Black and 9% were Hispanic.

Figure 3. Self-harm ED visit rates among Virginia youth aged 9-18 years, by sex and age group, 2016-2021

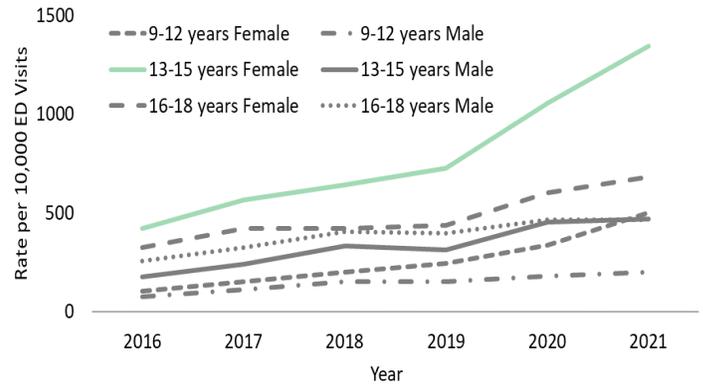
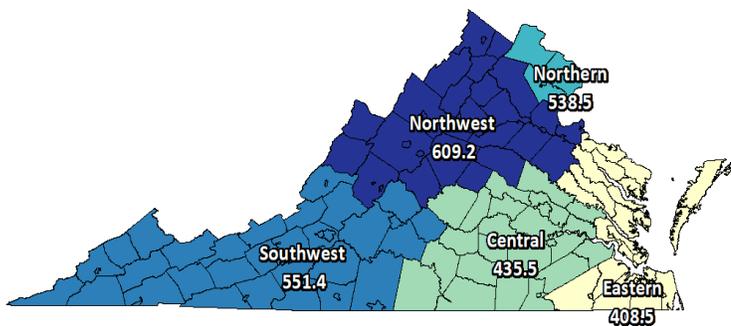


Figure 4. ED visit rates for suicidal thoughts, self-harm, and suicide attempts among Virginia youth aged 9-18 years by region, 2019-2021

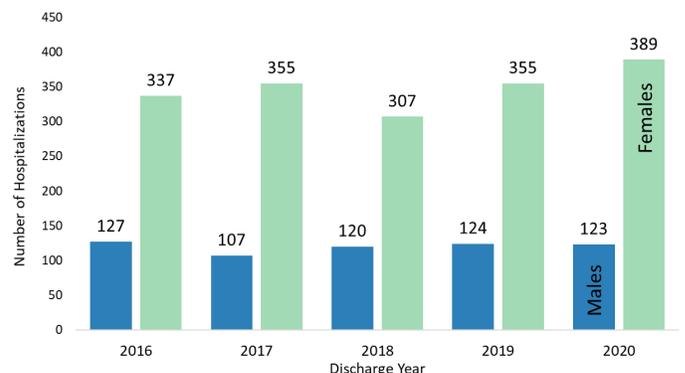


During the three-year period from 2019-2021, self-harm ED visit rates were highest among Northwest region residents (609.2 per 10,000 ED visits), followed by Southwest (551.2 per 10,000 visits), Northern (538.5 per 10,000 visits), Central (435.5 per 10,000 visits), and Eastern (609.2 per 10,000 visits) regions. (Figure 4).

Nonfatal Self-Harm Hospitalizations

From 2016-2020, there were 2,345 nonfatal self-harm hospitalizations among Virginia youth aged 9-18 years. Nonfatal self-harm hospitalizations among this age group increased 10% from 2016 to 2020 (464 in 2016 to 512 in 2020). About three out of four (74%) nonfatal self-harm hospitalizations each year were female. Hospitalizations among females increased 15% from 2016 to 2020 (337 in 2016 to 389 in 2020) but were stable among males over the same five-year time period. (Figure 5).

Figure 5. Nonfatal self-harm hospitalizations among Virginia youth aged 9-18 years by sex, 2016-2020



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Nonfatal Self-Harm Hospitalizations (continued)

From 2016-2020, almost six out of 10 (59%) of nonfatal self-harm hospitalizations were non-Hispanic White. On average, 21% of nonfatal self-harm hospitalizations were non-Hispanic Black.

The Central region had the highest average annual rate of nonfatal self-harm hospitalizations from 2016-2020 at 60.2 per 100,000 population, followed by Northwest (49.1), Southwest (47.5), Eastern (40.2), and Northern (35.2; Figure 6).

Figure 6. Nonfatal self-harm hospitalization average annual rate per 100,000 population among Virginia youth aged 9-18 years by region, 2016-2020

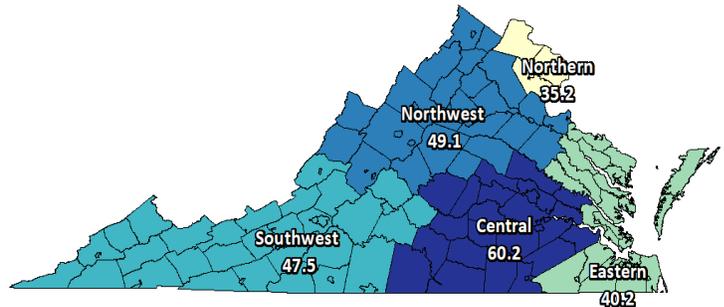
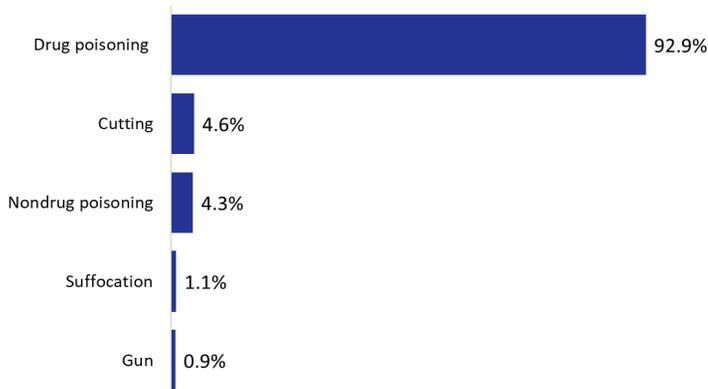


Figure 7. Five most frequent causes of self-harm hospitalization among Virginia youth aged 9-18 years, 2016-2020



From 2016-2020, the majority of nonfatal self-harm hospitalizations were due to drug poisoning (93%), followed by 5% due to cutting, and 4% due to non-drug poisoning, which includes alcohol (Figure 7). Causes of self-harm are not mutually exclusive. This means that a self-harm hospitalization might be due to more than one cause (drug poisoning and cutting, for example). Among those self-harm hospitalizations due to drug poisoning from 2016-2020 (n=2,178), the most used drug was 4-aminophenol derivatives, also known as acetaminophen (28%). Acetaminophen is a widely available over-the-counter drug used for pain relief. This was followed by selective serotonin reuptake inhibitors (SSRIs) at 20%. SSRIs are prescribed for depression or anxiety.

In 2020, the average length of stay for a nonfatal self-harm hospitalization for youth aged 9-18 years was a little over three days. The average cost was almost \$27,000 per hospitalization. Young Virginians were hospitalized for self-harm-related injuries for 1,588 days with over \$13 million dollars in hospitalization costs in 2020. Approximately one-third (34%) of nonfatal self-harm hospitalizations in 2020 were paid by Medicaid.

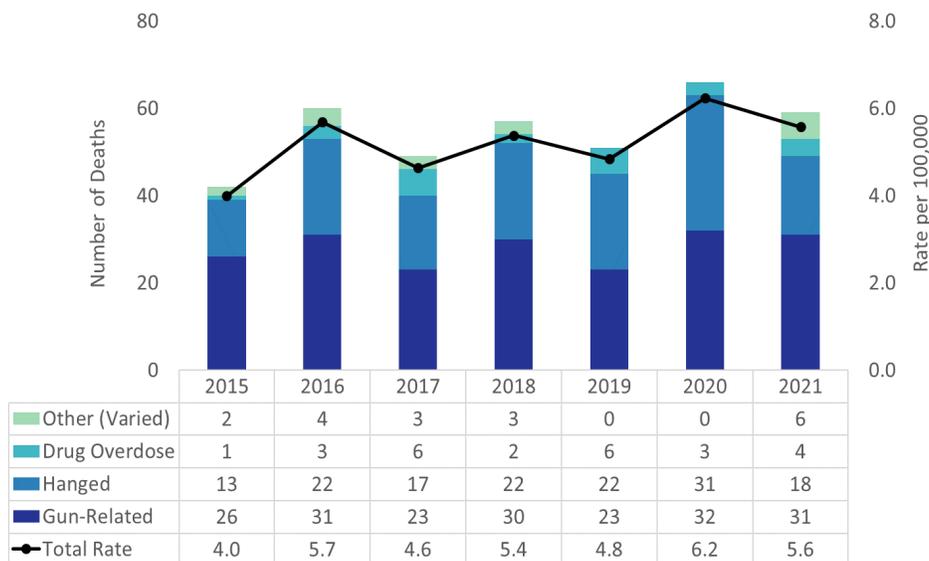
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Deaths by Suicide

From 2015-2021, there were 384 suicides among youth aged 9-18 years in Virginia. In general, suicides among youth aged 9-18 years have been increasing over the last seven years (2015-2021; Figure 8). The largest number of suicides among this population (n=66) was in 2020. Although the annual increase in 2020 coincided with the COVID-19 pandemic, the increase was not statistically significant.

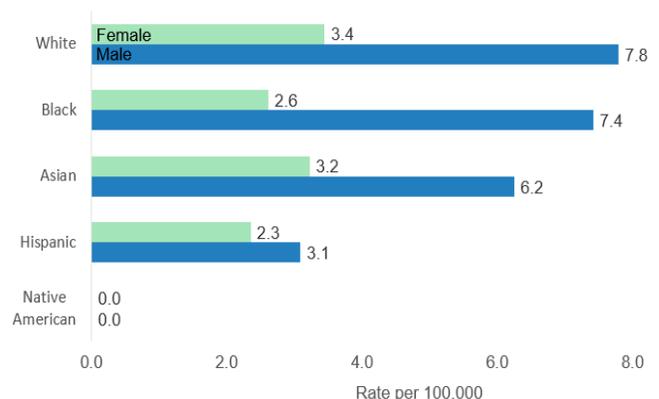
During 2015-2021, gun-related suicides (51%) were the most common cause of youth suicide, followed by suicidal hangings (39%). Annual suicide rates from 2015-2021 ranged from 4.0 to 6.2 per 100,000 population.

Figure 8. Count and rate of suicide among youth aged 9-18 years by most common causes of death, 2015-2021



Over the seven year span, females made up 29% of suicides among youth aged 9-18 years, and males made up 71%. Three-year aggregated rates (2019-2021) of suicide by sex and race/ethnicity indicated that White males had the highest rate of suicide (7.8; Figure 9). This was closely followed by Black males and Asian males (7.4 and 6.2, respectively). Suicide rates among females were similar across different race/ethnicity groups and ranged from 2.3 to 3.4. No Native American males or females were identified among youth suicides from 2019-2021.

Figure 9. Three-year aggregated rate of suicide among youth aged 9-18 years by sex and race/ethnicity, 2019-2021



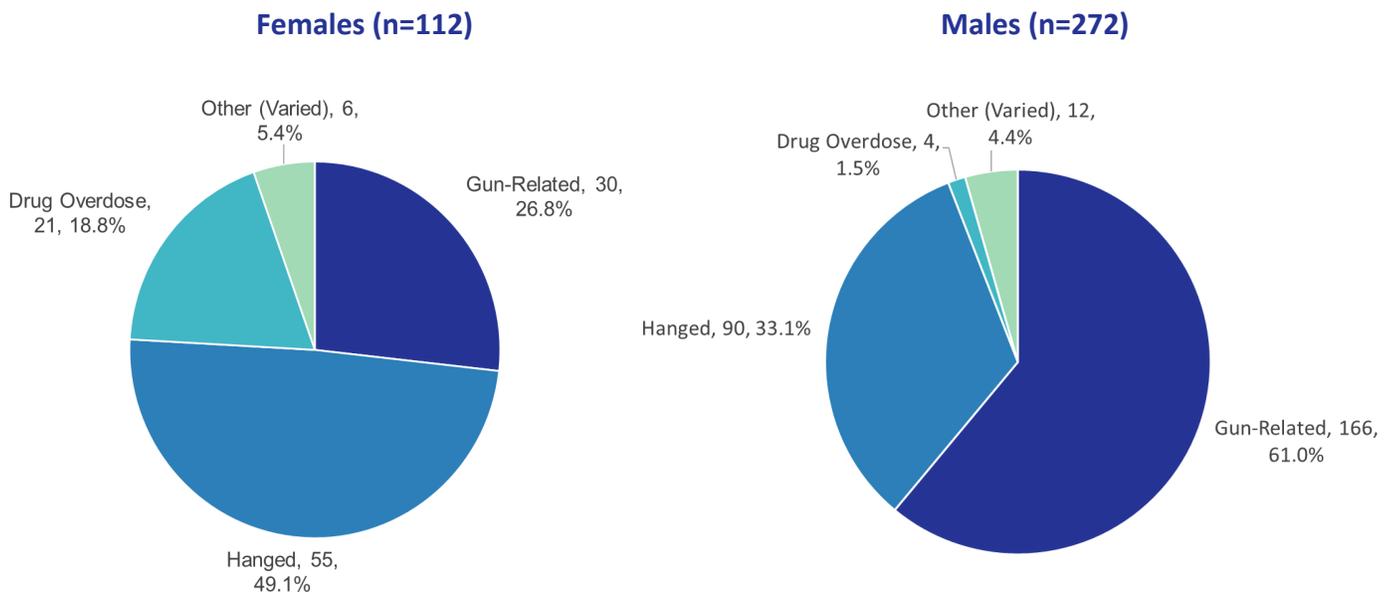
*Sixteen fatalities identified as other race/ethnicity were excluded from rate calculations due to unknown denominator values

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Deaths by Suicide (continued)

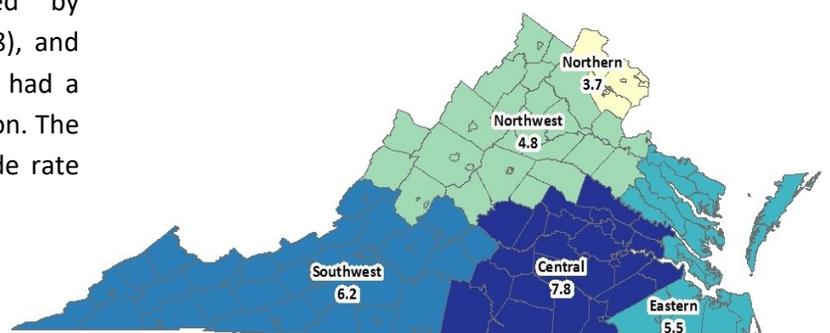
The cause of death among youth suicides differed by sex. Of the 112 suicides among females aged 9-18 years from 2015-2021, almost half were due to hangings, followed by gun-related suicides (27%), drug overdose (19%), and other varied causes (5%). However, compared to males, gun-related suicides made up 61% of the 272 total male suicides, followed by hangings (33%), other varied causes (4%), and drug overdose (2%; Figure 10).

Figure 10: Seven-year aggregated percentage of leading cause of death among suicides in youth aged 9-18 years by sex, 2015-2021



Three-year aggregated rates of suicide by region of residence for 2019-2021 showed that the Central region had the highest rate of youth suicide with 7.8 deaths per 100,000 population, followed by Southwest (6.2), Eastern (5.5), Northwest (4.8), and Northern (3.7; Figure 11). The Central region had a rate more than twice that of the Northern region. The overall three-year aggregated statewide suicide rate was 5.5 youth suicides from 2019-2021.

Figure 11: Three-year aggregated rate of suicide among youth aged 9-18 years by region of residence, 2019-2021



* Eight unknown or out of state residents were excluded from this analysis

Impact During the COVID-19 Pandemic

There were an unprecedented number of stressors and challenges during the COVID-19 pandemic, including many [risk factors](#) that could impact self-harm and suicide rates. Virginia observed these trends during the COVID-19 pandemic:

- Self-harm ED visits among youth were increasing before the pandemic. They remained steady during 2020 even while overall ED visits decreased. Self-harm ED visits then increased again in 2021.
- There was an increase in nonfatal self-harm hospitalizations before the pandemic. This increase was mostly among females. Yet, total nonfatal self-harm hospitalizations among youth were highest in 2020.
- Although there was a slight increase in suicides in 2020, there was not a statistically significant difference in the number of suicides among youth during the pandemic compared to before the pandemic.

Data Definitions, Methods, and Limitations

Data years are different for these reasons listed: 1) availability and completeness of the most recent data from each source; and 2) changes in methodology that would cause challenges in reporting trends across larger periods of time.

ED visits: Emergency department (ED) visit data were reported to the VDH Office of Epidemiology by hospital-based and freestanding EDs in Virginia. ED visits related to suicidal thoughts, self-harm, or suicide attempts among 9-18 year old Virginia residents were identified using terms in either the chief complaint (reason for visit) or discharge diagnosis or by ICD-10 diagnosis codes that indicate suicidal ideation, self-directed violence, or both. ED visit rates provide a consistent calculation to compare demographic groups or geographic areas. However, data quality has improved over time, which may impact trends over time. During the COVID-19 pandemic, a decrease in the total number of ED visits occurred in Virginia. Because of this change in health care seeking behavior, VDH urges caution when using rates per 10,000 ED visits during 2020. Read more about [syndromic surveillance data](#), including its limitations. **Hospitalizations (Nonfatal):** Hospitalization cases represent Virginia resident hospitalizations within Virginia. Virginia resident cases hospitalized outside of Virginia would be excluded. There was n=1 unknown for sex in Figure 6 in 2019. Data are reported to VDH and analyzed by the VDH Office of Family Health Services Division of Population Health Data. Data are produced and processed from sources believed to be reliable and accurate at that point of time. Self-harm injury hospitalization indicators are based on [CSTE Injury Surveillance Toolkit guidance](#). **Deaths:** Data on suicides were obtained from the VDH Office of the Chief Medical Examiner's (OCME) Virginia Medical Examiner Data System (VMEDS). VMEDS collects data on cases reported to and accepted by the OCME. All suicides reported in this report are based on deaths that occurred in Virginia and are not necessarily residents of Virginia. All suicide rates presented are based on per 100,000 population. Asian, Black, Native American, and White races represent persons of non-Hispanic ethnicity. Hispanics are persons identified as a White race with Hispanic ethnicity. 'Other race' are persons identified as more than one race or Black, Asian, or Native American race with Hispanic ethnicity.

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Resources and Trainings:

VDH is focusing efforts on suicide prevention through training and resources, technical assistance, and policy development. VDH aligns all state and local suicide prevention activities with the Centers for Disease Control and Prevention's (CDC) Preventing Suicide: A Technical Package of Policy, Programs, and Practices to promote a comprehensive and evidence-based approach to preventing suicide for all Virginians.

National Suicide Prevention Lifeline: 1-800-273-TALK (8255)

Free and confidential 24/7 phone line available for people who are in distress and seeking help or their loved ones, and for healthcare professionals looking for best practices for suicide prevention.

Reducing Access to Lethal Means:

Lock and Talk: This project promotes safe and responsible storage of guns, medications, and other forms of lethal means through trainings and the distribution of free cable/trigger locks for firearms and locking medication boxes.

Trainings:

- Applied Suicide Intervention Skills Training (ASIST)
- Suicide Alertness for Everyone (SafeTALK)
- Question, Persuade, Refer (QPR)
- Recognizing and Responding to Suicide Risk

For more information on suicide prevention trainings: [https:// www.vdh.virginia.gov/suicide-prevention/training/](https://www.vdh.virginia.gov/suicide-prevention/training/)

Collaborations:

Suicide Prevention Interagency Advisory Group (SPIAG): Interagency workgroup, with the Virginia Department of Behavioral Health and Developmental Services and other state and local organizations, that works to develop suicide prevention policy and primary prevention efforts through the *Suicide Prevention Across the Lifespan Plan for the Commonwealth of Virginia*.

FOR MORE INFORMATION:

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Citations:

1. <https://wisqars.cdc.gov/cgi-bin/broker.exe>
2. <https://nccd.cdc.gov/youthonline/App/Default.aspx>
3. <https://www.cdc.gov/mmwr/volumes/69/su/pdfs/su6901a6-H.pdf>
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